US National Phase for PCT/JP2005/002272
Applicant: Yamamoto et al.
Title: Dihalide, Polymer Compound and Method for Producing the Same
Docket No. 75954-010300/US
Filed Herewith (17 August 2006)
ELECTRONIC FILING

AMENDMENTS IN THE CLAIMS

Claim 1 (original): A dihalide represented by the following formula: [Formula 1]

$$R^3$$
 R^3
 R^3
 R^3

(wherein R¹ and R² represent a halogen, R² and R² represent an alkyl group or a silyl group having a substituent, and R³ and R³ represent a hydrogen or an alkyl group).

Claim 2 (currently amended): A-The dihalide group according to claim 1, wherein the silyl group having the substituent is at least one selected from the group consisting of $Si(CH_3)_3$, $Si(n-C_4H_9)_3$, $Si(t-C_4H_9)_3$, $Si(CH_3)_2$ (C_6H_5) and $Si(CH_3)_2$ ($n-C_{18}H_{37}$).

Claim 3 (currently amended): The A-dihalide according to claim 1 or 2 wherein the alkyl group is an alkyl group having a carbon number of 1-20.

Claim 4 (original): A polymer compound having a structure represented by the following formula in its main chain:

[Formula 2]

(wherein R² and R² represent an alkyl group or a silyl group having a substituent, and R³ and R³ represent a hydrogen or an alkyl group).

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Claim 5 (currently amended): The A-polymer compound according to claim 4, which is

$$\begin{array}{c|c}
0R^2 & 0R^2
\end{array}$$

represented by the following formula:

(wherein R² and R² represent an alkyl group or a silyl group having a substituent, and R³ and R³ represent a hydrogen or an alkyl group, and n represents a polymerization degree and is 5-1000).

Claim 6 (currently amended): The A-polymer compound according to claim 4, which is a copolymer comprising the structure represented by the formula claimed in claim 4 and another structure.

Claim 7 (currently amended): The A-polymer compound according to claim 5 wherein the copolymer is at least one selected from the group consisting of the following formulae:

[Formula 4]

(wherein R⁴, R⁴, R⁵ and R⁵ represent an alkyl group), [Formula 4]

$$\left(\bigotimes_{R',0} \bigoplus_{QR',1} \mathbb{R}^s \xrightarrow{R^s} \right)$$

(wherein R⁴, R⁴, R⁵ and R⁵ represent an alkyl group),

[Formula 5]

$$(R^{i}O) = (R^{i}O)$$

$$OR^{i}$$

(wherein R^6 and R^6 represent an alkyl group or a silyl group having a substituent, and R^7 and R^7 represent an alkyl group),

[Formula 6]

(wherein R⁶ and R⁶ represent an alkyl group or a silyl group having a substituent), [Formula 7]

$$\bigoplus_{\mathbb{R}^4 \cup \mathbb{O} \mathbb{R}^{8'}} \mathbb{R}^{7'} \mathbb{R}^{3'}$$

(wherein R^6 and R^6 ' represent an alkyl group or a silyl group having a substituent, and R^7 and R^7 ' represent an alkyl group), and

[Formula 8]

(wherein R⁷, R⁷, R⁸, R⁸, R⁹ and R⁹ represent an alkyl group).

Claim 8 (currently amended): The A-polymer according to any one of claims 4-7, claim 4 wherein the alkyl group is an alkyl group having a carbon number of 1-20.

Claim 9 (currently amended): A method for producing a polymer compound, in which a polymer compound as claimed in any of one of claims 4-8 in claim 4 is obtained by dehalogenation -polymerizing a dihalide as claimed in claim 1 or 2 represented by the following formula:

[Formula 1]

$$R^3$$
 R^3
 R^3
 R^3
 R^3

(wherein R¹ and R² represent a halogen, R² and R² represent an alkyl group or a silyl group having a substituent, and R³ and R³ represent a hydrogen or an alkyl group).

Claim 10 (currently amended): A—The method for producing a polymer compound according to claim & 9, wherein the dehalogenation-polymerization is performed in the presence of palladium or nickel compound.

Claim 11 (currently amended): A thin film obtained by using polymer compound as claimed in any of one of claims 4-8 in claim 4.

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Claim 12 (new): The method of claim 9 wherein the silyl group having the substituent is at least one selected from the group consisting of $Si(CH_3)_3$, $Si(n-C_4H_9)_3$, $Si(t-C_4H_9)_3$, $Si(CH_3)_2$ (C_6H_5) and $Si(CH_3)_2$ ($n-C_{18}H_{37}$).

Claim 13 (new): The method for producing a polymer compound according to claim 12, wherein the dehalogenation-polymerization is performed in the presence of palladium or nickel compound.